

### **REMARKS/ARGUMENTS**

Claims 1-21 are currently pending in this application, all of which are rejected. Applicants have amended claim 18 merely to correct a typographical error and re-listed the claims to include the proper claim identifier. Claim 20 has been amended to more clearly define the claimed subject matter, support for the amendment can be found on page 7, lines 22-28. New claims 22 and 23 have been added, support for which can be found on page 8, lines 18-22 and page 11, lines 5-7. Applicants appreciate the opportunity to have discussed with the Examiner on November 19, 2007 the pending Office Action with respect to claims 1-21 as accurately is reflected in the Interview Summary. Reconsideration and allowance of the claims is respectfully requested in view of the foregoing amendments and the following remarks.

**1. Claims 1-21 are rejected under 35 U.S.C. § 103(a), as allegedly being obvious**

Claims 1-21 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Nakayama et al (US 4,287,308) in combination with Miller (US 4,255,307) for reasons of record. According to the Examiner the use of the specified sulfur containing agents in Miller in the process of Nakayama et al is warranted for several reasons including lack of bad smell. In addition, the Examiner asserts that the proposed substitution of the sulfur containing compounds does not have to result in a better or advantageous composition, all that is required is a reasonable expectation of success. Further, the Examiner asserts that the agents disclosed in Miller are known agents of very effectively reducing monomer content in a variety of acrylonitrile monomer containing products using such known agents for its precise function disclosed in Miller in another acrylonitrile monomer containing composition, which is also concerned with the same problem (reduction of monomer amounts) in place (or in addition) of another agent clearly warrants a reasonable expectation of successful removal of the monomer. Further, the Examiner asserts that even though Miller does not address specific characteristics of the agents it uses, or some specific effect of using those agents, the question is not whether the reference discloses certain advantages, rather it is whether those advantages are expected.

In response applicants submit Nakayama et al disclose reducing the amount of residual monomer in a process of preparing an expandable microsphere by cyanoethylation. Nakayama et al disclose various cyanoethylation agents including sulfides but not the distinct

class of sulfur containing agents as in the presently claimed invention. Furthermore, Nakayama et al disclose that their preferred cyanoethylation agents are primary and secondary lower alkylamines. The results in Table 1 of Nakayama et al also clearly illustrates their preference for such primary and secondary lower alkylamines. All of the members of this class of cyanoalkylation agents are performing better than most other agents in reducing residual monomer from the expandable microsphere. In contrast, Miller et al disclose the use of sulfites in reducing the amount of residual acrylonitrile in aqueous dispersions. The properties and characteristics of the aqueous dispersions in Miller are very different from the expandable microspheres taught in Nakayama et al. Thus, Applicants submit there is no motivation to combine the teachings of Miller with those of Nakayama et al, substituting the disclosed cyanoethylation agents in Nakayama et al with a sulfite as disclosed in Miller to arrive at the claimed process. The class of sulfur containing agents in Nakayama et al is clearly inferior to the preferred primary or secondary lower alkylamines as a cyanoethylation agent. Accordingly, one skilled in the art would not have been motivated reading the disclosure of Nakayama et al to use the sulfites, another class of sulfur containing agents, disclosed in Miller et al in reducing the amount of residual monomers in a process of producing expandable microspheres.

In addition, the claimed process unexpectedly provides advantageous characteristics with respect to other properties of the resulting expandable microspheres such as retaining excellent expansion abilities and brightness. In the current application there is provided objective evidence that when using sodium sulfide, as in Nakayama et al, to reduce the amount of residual monomer in the expandable microsphere the brightness thereof is dramatically reduced. However, unexpectedly the use of a different class of sulfur containing agents as in the claimed invention both significantly reduces the amount of residual monomer in the expandable microsphere while at the same time retaining a high brightness, see for example table 1 of page 11 of the specification. Thus not only does Nakayama et al in combination with Miller fails to teach or suggest the claimed invention, the claimed process provides unexpectedly better results of significantly reducing the amount of residual monomer but also retaining color brightness of the expandable microsphere.

Therefore, Applicants submit that the claimed process of producing expandable microspheres or reducing the amount residual monomers in an expandable microsphere is not

taught or suggested by Nakayama et al in view of Miller. Accordingly, Applicants submit that the claimed invention is non-obvious over the cited references and withdrawal of the rejections of claims 1-21 under 35 U.S.C. § 103(a) is respectfully requested.

**2. Claim 20 is rejected under 35 U.S.C. § 102/103, as allegedly being anticipated or obvious**

Claim 20 is rejected under 35 U.S.C. 102(b) as allegedly anticipated by or, in the alternative, under 35 U.S.C. 103(a) as allegedly being unpatentable over Nakayama et al for reasons of record. According to the Examiner the Nakayama et al reference discloses several microspheres containing residual nitrile monomers of a level below the claimed level as in tables 1 and 2. The Examiner asserts that since the disclosed product is substantially corresponds to the claimed composition, it is reasonably believed that the disclosed polymeric microspheres inherently exhibit the claimed properties.

In response Applicants submit that claim 20 requires an expandable thermoplastic microspheres comprising a thermoplastic polymer shell encapsulating a propellant and at least one non-polymeric reaction product of at least one monomer used for the polymer shell and an agent selected from the group consisting of oxo acids of sulfur, salts and derivatives thereof, comprising at least one sulfur atom having at least one free electron pair and binding three oxygen atoms, said polymer shell being made of a homo- or copolymer from ethylenically unsaturated monomers and total amount of nitrile containing monomers in the polymer shell is at least about 70 % wt, said microspheres comprising less than about 100 ppm residual nitrile containing monomers and having a brightness according to ISO 2470 of at least about 75%. The claimed expandable microsphere thus contains a non-polymeric reaction product of at least one monomer used for the polymer shell and an agent selected from the group consisting of oxo acids of sulfur, salts and derivatives thereof as recited in claim 20. Nakayama et al disclose the use of a cyanoethylation agent in preparing expandable microspheres. However, the cyanoethylation agents in Nakayama et al differ from the oxo acids of sulfur, salts and derivatives thereof as recited in claim 20. Thus the expandable microspheres disclosed in Nakayama et al do not include a non-polymeric reaction product of at least one monomer used for the polymer shell and an agent selected from the group consisting of oxo acids of sulfur, salts and derivatives thereof, comprising at least one sulfur atom having at least one free electron pair and binding

three oxygen atoms. Accordingly, the disclosure in Nakayama is defective with respect to at least one element required in the claimed invention and therefore does not anticipate claim 20.

Moreover, for the same reasons as above the Nakayama et al reference fails to teach or suggest the use of the oxo acids of sulfur, salts and derivatives thereof as recited in claim 20 in preparing the expandable microspheres. As described above the use of such agents as in the claimed process and products thereby results in a dramatic reduction of the amount of acrylonitrile monomers in the expandable microspheres obtained from polymerizing ethylenically unsaturated monomers while at the same time remaining a high level of brightness not taught or suggested in Nakayama et al.

Therefore, Applicants submit that the claimed expandable microspheres are neither disclosed nor taught or suggested by the disclosure in Nakayama et al. Accordingly, Applicants submit that the claimed invention is neither anticipated by, nor obvious over the cited reference and withdrawal of the rejection of claim 20 under 35 U.S.C. § 103(a) is respectfully requested.

It is believed that claims 1-23 are now in condition for allowance, early notice of which would be appreciated. If any outstanding issues remain, the examiner is invited to telephone the undersigned at the telephone number indicated below to discuss the same.

A separate Petition for Extension of Time is submitted herewith. Should any additional fees be due, however, please charge such fees to Deposit Account No. **11-0600**.

Respectfully submitted,

Dated: December 19, 2007

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